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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/588,998	06/06/2000	Curtis Lee Carrender	12270-B	9318

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EXAMINER	
DUONG, FRANK	

ART UNIT	PAPER NUMBER
2666	6

DATE MAILED: 04/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/588,998	CARRENDER, CURTIS LEE
	Examiner	Art Unit
	Frank Duong	2666

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 June 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2-3.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is a response to the communication dated 06/06/00. Claims 1-29 are pending in the application.

Information Disclosure Statement

2. The information disclosure statement filed 8/28/00, 2/1/02 and 2/27/03 comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609. They have been considered and placed in the application file.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Elberty et al (USP 6,084,512) (hereinafter "Elberty").

Regarding **claim 1**, in accordance with Elberty reference entirety, Elberty discloses a method of radio frequency communication (Fig. 1), the method comprising:

transmitting a first signal at a first frequency (118) from a first transponder (100) to a second transponder (500) (*col. 4, lines 21-23 and lines 35-40*);

phase locking on the first signal to create a reference signal (*col. 4, lines 45-51*);

transmitting a second signal (118) at a second frequency from the first transponder (100) to the second transponder (500) (*col. 5, lines 3-11*);

comparing the second signal (118) to the reference signal (*col. 5, lines 31-38*); and

determining a distance between the first and second transponders based on a phase difference between the second and reference signals (col. 6, lines 5-10 or lines 15-57).

Regarding **claim 2**, in addition to features recited in base claim 1 (see rationales discussed above), Elberty further discloses wherein the first transponder is an interrogator (100) and the second transponder is an RF tag (500) (Fig. 1).

Regarding **claim 3**, in addition to features recited in base claim 2 (see rationales discussed above), Elberty further discloses receiving a radio frequency interrogation signal from the interrogator (120) (*col. 5, lines 5-11*);

modulating the interrogation signal according to an information code to produce a response signal (122) (*col. 5, lines 59-64*); and

transmitting the response signal (122) from the RF tag (500) to the interrogator (100) (*col. 5, lines 39-41*).

Regarding **claim 4**, in addition to features recited in base claim 1 (see rationales discussed above), Elberty further discloses wherein the comparing step includes mixing the reference signal with the second signal to obtain a mixed signal (520) (co. 10, lines

49-57) and the determining step includes determining how many nulls or peaks there are in the mixed signal (col. 6, lines 50-57).

Regarding **claim 5**, in addition to features recited in base claim 4 (see rationales discussed above), Elberty further discloses wherein the step of determining how many nulls or peaks there are in the mixed signal is performed at the second transponder (col. 6, lines 50-57) and the step of determining the distance between the first and second transponders includes transmitting to the first transponder (100) an indication (4.9 GHz) of the how many nulls or peaks there are in the mixed signal (col. 10, lines 45-67) and determining the distance from the indication (4.9 GHz) and the first (120) and second frequencies (122) (col. 9, lines 5-19).

Regarding **claim 6**, in addition to features recited in base claim 1 (see rationales discussed above), Elberty further discloses wherein the distance determined is a first distance and the first and second signals are transmitted via a first antenna (any of 104 or 106) of the first transponder (100) (col. 9, lines 35-39), the first transponder having a second antenna spaced apart from the first antenna (Fig. 1; 104 and 106) the method further comprising:

determining a second distance between the second antenna (104 or 106) of the first transponder (100) and the second transponder (500) based on a phase difference between the signals transmitted through the second antenna (104 or 106) (*col. 9, lines 35-38*); and

determining a direction (location) from the first transponder (100) to the second transponder (500) based on the first and second distances and a distance between the first and second antennas (*col. 9, lines 39-40*).

Regarding **claim 7**, in addition to features recited in base claim 1 (see rationales discussed above), Elberty further discloses wherein the reference signal is a first reference signal and the first and second signals are transmitted via a first antenna of the first transponder, the method further comprising: transmitting a third signal at the first frequency from a second antenna of the first transponder to the second transponder; phase locking on the third signal to create a second reference signal; transmitting a fourth signal at the second frequency from the second antenna of the first transponder to the second transponder; comparing the fourth signal to the second reference signal; determining a distance between the second antenna of the first transponder and the second transponder based on a phase difference between the fourth signal and the second reference signal; and determining a location of the second transponder based on the distances determined (*note: at col. 9, lines 35-41, Elberty discloses CPU 102 utilizes the output of the mixer 426 as an input to calculate the distance from the responding tag 500 that transmitted the response signal 122 to the given one of the antenna 104 that transmitted the signal ID code 120. With at least three distance equations stored in the memory, the CPU 102 can proceed to determine the tag's location. Thus, the recitation thereat is inherently read on the claimed limitations as the disclosed distance measure process is repeated for a different tag using a different antenna 104*).

Regarding **claim 8**, in addition to features recited in base claim 1 (see rationales discussed above), Elberty further discloses wherein the second signal is a frequency modulated signal that includes a plurality of frequency portions at a plurality of frequencies (*col. 8, line 59 to col. 9, line 3*).

Regarding **claim 9**, in addition to features recited in base claim 1 (see rationales discussed above), Elberty further discloses wherein: the step of transmitting the second signal includes transmitting a plurality of frequency portions each at a different frequency (*col. 8, lines 34-47*); the comparing step includes comparing each of the frequency portions to the reference signal by mixing each of the frequency portions with the reference signal to produce a plurality of mixed signals (*col. 10, lines 24-44*); and the distance determining step includes counting nulls or peaks in each of the mixed signals (*col. 9, lines 4-41*).

Regarding **claim 10**, in accordance with Elberty reference entirety, Elberty discloses a method of radio frequency communication (Fig. 1), the method comprising:

transmitting a first signal (118) at a first frequency from a first transponder (100) to a second transponder (500) (*col. 4, lines 21-23 and lines 35-40*);

transmitting a second signal (120) at a second frequency from the first transponder (100) to the second transponder (500) (*col. 5, lines 3-11*);

comparing the second signal to the first signal (*col. 5, lines 31-38*); and determining a distance between the first and second transponders based on a phase difference between the first and second signals (col. 6, lines 5-10 or lines 15-57).

Regarding **claim 11**, in addition to features recited in base claim 10 (see rationales discussed above), Elberty further discloses wherein the first transponder is an interrogator (100) and the second transponder is an RF tag (500).

Regarding **claim 12**, in addition to features recited in base claim 11 (see rationales discussed above), Elberty further discloses receiving a radio frequency interrogation signal from the interrogator (*col. 9, line 45 and thereinafter*); modulating the interrogation signal according to an information code to produce a response signal (*col. 10, lines 49-63*); and transmitting the response signal from the RF tag to the interrogator (*col. 10, lines 64-65*).

Regarding **claim 13**, in addition to features recited in base claim 11 (see rationales discussed above), Elberty further discloses wherein the comparing step is performed by the RF tag (*col. 10, lines 24-44*) and includes phase locking on the first signal to create a reference signal and mixing the reference signal with the second signal to obtain a mixed signal (*col. 10, lines 45-67*); and the determining step includes determining how many nulls or peaks there are in the mixed signal (*col. 9, lines 1-34*).

Regarding **claim 14**, in addition to features recited in base claim 13 (see rationales discussed above), Elberty further discloses wherein the step of determining how many nulls or peaks there are in the mixed signal is performed at the second transponder (*col. 10, lines 51-65*) and the step of determining the distance between the first and second transponders includes transmitting to the first transponder (100) an indication (4.90 GHz) of the how many nulls or peaks there are in the mixed signal (*col.*

10, lines 51-65) and determining the distance from the indication and the first and second frequencies (*col. 9, lines 1-37*).

Regarding **claim 15**, in addition to features recited in base claim 10 (see rationales discussed above), Elberty further discloses wherein the distance determined is a first distance and the first and second signals are transmitted via a first antenna (any of 104) of the first transponder (100), the first transponder having a second antenna spaced apart (see Fig. 1; 104 or 106) from the first antenna the method further comprising: determining a second distance between the second antenna of the first transponder and the second transponder based on a phase difference between the signals transmitted through the second antenna; and determining a direction from the first transponder to the second transponder based on the first and second distances and a distance between the first and second antennas (*note: at col. 9, lines 35-41, Elberty discloses CPU 102 utilizes the output of the mixer 426 as an input to calculate the distance from the responding tag 500 that transmitted the response signal 122 to the given one of the antenna 104 that transmitted the signal ID code 120. With at least three distance equations stored in the memory, the CPU 102 can proceed to determine the tag's location. Thus, the recitation thereat is inherently read on the claimed limitations as the disclosed distance measure process is repeated for a different tag using a different antenna 104*).

Regarding **claim 16**, in addition to features recited in base claim 10 (see rationales discussed above), Elberty further discloses wherein the first and second signals are reflected back to the first transponder (100) by the second transponder (500)

(*col. 10, lines 60-65*) and the comparing and determining steps are performed by the first transponder (100) (*col. 8, line 59 to col. 9, line 3*).

Regarding **claim 17**, in addition to features recited in base claim 10 (see rationales discussed above), Elberty further discloses wherein the distance determined is a first distance, the method further comprising: moving the first transponder from a first position from which the first distance is determined, to a second position; transmitting a third signal at the first frequency from the first transponder to the second transponder; transmitting a fourth signal at the second frequency from the first transponder to the second transponder; comparing the fourth signal to the third signal; determining a second distance between the first and second transponders based on a phase difference between the third and fourth signals; and determining a location of the second transponder based on the first and second distances and the first and second positions of the first transponder *note: at col. 9, lines 35-41, Elberty discloses CPU 102 utilizes the output of the mixer 426 as an input to calculate the distance from the responding tag 500 that transmitted the response signal 122 to the given one of the antenna 104 that transmitted the signal ID code 120. With at least three distance equations stored in the memory, the CPU 102 can proceed to determine the tag's location. Moreover, at col. 12, lines 28-65, Elberty further discloses the use of a calibration tag to obtain one of the three distance equations. Thus, the recitation thereat is inherently read on the claimed limitations in a manner as claimed*).

Regarding **claim 18**, in addition to features recited in base claim 10 (see rationales discussed above), Elberty further discloses wherein the second signal is a

frequency modulated signal that includes a plurality of frequency portions at a plurality of frequencies (*col. 10, lines 58-67*).

Regarding **claim 19**, in addition to features recited in base claim 10 (see rationales discussed above), Elberty further discloses wherein: the step of transmitting the second signal includes transmitting a plurality of frequency portions each at a different frequency (*col. 8, lines 34-47*); the comparing step includes comparing each of the frequency portions to the reference signal by mixing each of the frequency portions with the reference signal to produce a plurality of mixed signals (*col. 10, lines 24-44*); and the distance determining step includes counting nulls or peaks in each of the mixed signals (*col. 9, lines 4-41*).

Regarding **claim 20**, in accordance with Elberty reference entirety, Elberty discloses a radio frequency communication (Fig. 1), comprising:

an interrogator (100) that transmits a radio frequency interrogation signal (118 or 120) and receives a response signal (122); and

a transponder (500) that receives the interrogation signal (118 or 120) and transmits the response signal (122) to the interrogator (100), the transponder including:

a memory (516) that stores an information code (col. 10, lines 30-31); and

a modulator (520) coupled to the memory (516) and structured to produce the response signal (122) by modulating the interrogation signal (118 or 120) according to the information code (ID code) (col. 10, lines 49-65) wherein a first one of the transponder and interrogator includes a variable frequency source (408) that transmits to a second one of the transponder and interrogator a first signal at a first frequency

followed by a second signal at a second frequency (*col. 8, lines 28-33*); of the transponder and interrogator includes a phase comparison circuit (112) that detects phase shifts in the second signal relative to the first signal (*col. 8, line 65 to col. 9, line 3*); and one of the transponder and interrogator includes a distance determiner (102) that determines the transponder and the interrogator based on the phase shifts (*col. 9, lines 3-41*).

Regarding **claim 21**, in addition to features recited in base claim 20 (see rationales discussed above), Elberty further discloses wherein the interrogator (100) includes the variable frequency source (408) and the transponder (500) includes the phase comparison circuit (516) (*col. 10, lines 24-44*).

Regarding **claim 22**, in addition to features recited in base claim 21 (see rationales discussed above), Elberty further discloses wherein the phase comparison circuit includes: a phase lock loop (504) that phase locks on the first signal (118) to produce a reference signal (414); a mixer (520) coupled to the phase lock loop (504) and structured to mix the reference signal with the second signal (508) to obtain a mixed signal (output of 520); and a counter (516) coupled to the mixer (520) and structured to determine a null or peak count of how many nulls or peaks there are in the mixed signal (*col. 10, lines 49-67*).

Regarding **claim 23**, in addition to features recited in base claim 22 (see rationales discussed above), Elberty further discloses wherein the interrogator includes

means for calculating the distance (102) between the interrogator and the transponder based on the null or peak count which is sent to the interrogator by the transponder (*col. 9, lines 5-41*).

Regarding **claim 24**, in addition to features recited in base claim 20 (see rationales discussed above), Elberty further discloses wherein the interrogator (100) includes the variable frequency source (408) and the phase comparison circuit (112).

Regarding **claim 25**, in addition to features recited in base claim 20 (see rationales discussed above), Elberty further discloses wherein the second signal (122) is a frequency modulated signal (*col. 10, lines 59-67*).

Regarding **claim 26**, in accordance with Elberty reference entirety, Elberty discloses a radio frequency transponder, comprising:

an antenna (502) that receives from an interrogator first and second signals having first and second frequencies (118 and 120), respectively;

a phase lock loop (504) coupled to the antenna and structured to phase lock on the first signal to create a reference signal (514);

a comparator (520) coupled to the antenna and phase lock loop and structured to compare the second signal to the reference signal; and

means for determining a phase difference between the second and reference signals (516), the phase difference corresponding to a distance between the first and second transponders (*col. 10, lines 24-44 and col. 9, lines 4-41*).

Regarding **claim 27**, in addition to features recited in base claim 26 (see rationales discussed above), Elberty further discloses wherein the comparator (112)

includes a mixer (426) structured to mix the reference signal (120) with the second signal (122) to obtain a mixed signal (*col. 8, line 65 to col. 9, line 3*); and the means for determining (102) include a counter (not shown; inherent in 102) coupled to the mixer and structured to determine a null count of how many nulls there are in the mixed signal (*col. 9, lines 4-41*).

Regarding **claim 28**, in accordance with Elberty reference entirety, Elberty discloses radio frequency interrogator, comprising:

a variable frequency signal source (408) that produces a first signal at a first frequency (118) and a second signal at a second frequency (120);

antenna means (104) coupled to the signal source (408) for transmitting to a transponder (500) the first (118) and second (120) signals and for receiving the first and second signals (122) reflected back from the transponder (500);

a comparator (122) coupled to the antenna (104) and structured to compare the received second signal (120) to the reflected first signal (122); and

means for determining a distance (102) between the first and second transponders (100 and 500) based on a phase difference between the reflected first signal and the second signal (col. 9, lines 4-41).

Regarding **claim 29**, in addition to features recited in base claim 28 (see rationales discussed above), Elberty further discloses wherein the comparator (112) includes a mixer (426) that mixes the second signal (120) with the reflected first signal (122) to produce a mixed signal (*col. 8, line 65 to col. 9, line 3*) and the means for determining (102) includes a null or peak counter (not shown; inherent in CPU 102) that

counts nulls or peaks in the mixed signal; and a processor (102) structured to determine the distance based on the nulls or peaks in the mixed signal (*col. 9, lines 4-41*).

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Richardson (USP 3,098,971).

Vinding (UDP 3,299,424).

Verma et al (USP 5,528,232).

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank Duong whose telephone number is (703) 308-5428. The examiner can normally be reached on 7:00AM-3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (703) 308-5463. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Frank Duong
Examiner
Art Unit 2666

April 4, 2004